Low Temperature Cofired Ceramics (LTCC) is a widely applied technology for electronic components and substrates that are compact, light, and offer high degree of functionality. LTCC is also the most attractive technology solution to new and upcoming requirements to fulfill, high-speed data communications, and high frequency antenna and T/R module needs for 5G and IoT. However, with increasing demand for high reliability devices designed with greater architecture density and smaller package size, material cost becomes an important consideration in LTCC designs.

This work summarizes the efforts to reduce the costs of conductive features used in LTCC substrates while maintaining performance and reliability using metal core-shell powders and LTCC body powder with A6 and L8 type LTCC commercial tapes. The core-shell powders are engineered to provide equivalent performance to bulk, pure metal compositions and the physical characteristics of the core-shell powders are presented here along with microstructural analysis of the core-shell powders to show uniformity and continuity of the coatings on the LTCC body powder. The thickness of metal shell coatings can be controlled and varied between <5 Wt.% to >80 Wt.% metal. Coating morphology and microstructure is also controlled during the synthetic process of generating the coating on the core LTCC powder.

Conductive pastes fabricated with the core-shell powders are engineered both for ease of screen printing and to accommodate the thermal shrinkage requirements of the A6 and L8 LTCC tapes. The performance of the pastes with the LTCC bodies is investigated with test coupons and presented here.

Thursday, November 14, 2019
4:15 p.m. in Stowell Hall Room 211, SUNY Potsdam
Light refreshments will be served. All are welcome.